REMARKS

The Examiner has rejected the claims under various rejections, as addressed in detail below. The claims have been amended to correct typographical errors and to further clarify the subject matter being claimed in order to expedite allowance of the pending claims.

Claim 55 has been cancelled. Claim 59 has been added. Claims 1, 3-7, 9-29, 31-40, 42-54, and 56-59 are now pending.

Reconsideration of the application is respectfully requested based on the following remarks.

REJECTION OF CLAIMS 1, 3-18, 33, 51, AND 54-58 UNDER 35 USC §112

The Examiner has rejected claims 1, 3-18, 33, 51, and 54-58 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is fully traversed below.

The term "a port" is used only once to refer to a port of "a network device," and only once to refer to a port of "a second network device." All subsequent recitations refer to "the port of the network device" or "the port of the second network device." It is also important to note that the step of associating refers to "a port of a network device." The step of associating is further clarified by indicating that a message is sent by a first network device to "a port of a second network device." Accordingly, the claim language points out and distinctly claims the subject matter regarded as the invention.

The Examiner further asserts that the claim language is indefinite since it can cover both the cases where the port and/or network device is not the same for each of the virtual ports and where it is the same for each of the virtual ports. Specifically, as recited in the pending claims, each virtual port is associated with a port of a network device. Applicant notes that the recently added language "wherein each of the virtual ports is associated with

the same port or a different port from other virtual port associations and wherein each of the virtual ports is associated with the same network device or a different network device from other virtual port associations, thereby enabling one or more network devices within the storage area network to be associated with the virtual ports," which clearly shows that the intent is to, in fact, cover both of these cases. Applicant feels that this language is useful in order to clarify that each virtual port can be associated with a port of a network device, but the virtual ports need not be associated with the same port. Since the language of the claims is clear, the claim language cannot be indefinite. There is no rule that requires a claim to cover only one scenario. Rather, the claims have been further amended to clarify that the intent is to cover both of these scenarios. Applicant is unclear why the Examiner is asserting that the claim language is unclear, since the Examiner clearly understands the language to cover both of these cases. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1, 3-18, 33, 51, and 54-58 under 35 USC 112, second paragraph.

REJECTION OF CLAIMS 17, 33, AND 51 UNDER 35 USC §112

The Examiner has rejected claims 17, 33, and 51 under 35 USC 112, sixth paragraph, asserting that the specification fails to set forth the corresponding structure. This rejection is fully traversed below.

The specification clearly shows an example network in which the claims may be implemented, in FIG. 1B and page 13. Moreover, switches shown in FIGs. 3A and 3B and corresponding pages 19-23 are clearly described as being able to implement the disclosed embodiments. Since the switches described clearly set forth sufficient structure, Applicant respectfully asserts that this rejection is improper.

REJECTION OF CLAIM 21 UNDER 35 USC §102

In the Office Action, the Examiner has rejected claims 19-21, 32-35, and 50-52 under 35 USC § 102(e) as being anticipated by Terrell et al, U.S. Pat. No. US 7,200,144, ('Terrell' hereinafter). This rejection is fully traversed below.

Claim 19, as amended, recites:

A method of performing LUN mapping in a storage area network, the method comprising:

accessing a LUN mapping table having one or more entries, each of the entries identifying an initiator in the storage area network, one or more of a set of one or more virtual ports of a virtual enclosure, and associating a specified logical unit with one or more virtual storage units, wherein a number of virtual ports to be included in the virtual enclosure is configurable, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network, wherein the virtual enclosure is a virtual entity adapted for representing the set of one or more virtual storage units and each of the virtual ports is associated with a port of a network device within the storage area network to create a set of virtual port associations such that the virtual ports of the virtual enclosure are associated with one or more ports of one or more network devices within the storage area network, wherein each of the virtual ports is associated with the same port or a different port from other virtual port associations and wherein each of the virtual ports is associated with the same network device or a different network device from other virtual port associations, wherein the port of the network device has received a message from another network device instructing the port to handle messages addressed to the associated virtual port that are received by the port of the network device subsequent to the message sent by the another network device such that the another network device instructs the port of the network device to act on behalf of the virtual port; and

when a request for the specified logical unit is received from the initiator via one of the associated virtual ports, identifying one of the entries in the LUN mapping table and employing the one or more virtual storage units specified in the entry to service the request.

Terrell fails to disclose or suggest "wherein a number of virtual ports to be included in the virtual enclosure is configurable." The Examiner cites col. 32, lines 11-24 of Terrell. However, the cited merely discusses queues for storing frames that await transmission onto the network. The cited portion further discloses that the frame may be processed, a virtual destination port identifier may be recalled from a virtual context table, and the frame's destination port identifier may be modified in accordance with the virtual destination port identifier. Nothing in Terrell discloses or suggests that a number of virtual ports in a virtual

enclosure is configurable.

Moreover, Terrell fails to disclose or suggest "each of the virtual ports is associated with a port of a network device within the storage area network to create a set of virtual port associations such that the virtual ports of the virtual enclosure are associated with one or more ports of one or more network devices within the storage area network, wherein each of the virtual ports is associated with the same port or a different port from other virtual port associations and wherein each of the virtual ports is associated with the same network device or a different network device from other virtual port associations."

Terrell further fails to disclose or suggest "wherein the port of the network device has received a message from another network device instructing the port to handle messages addressed to the associated virtual port that are received by the port of the network device subsequent to the message sent by the another network device such that the another network device instructs the port of the network device to act on behalf of the virtual port." The Examiner cites col. 34, lines 31-64. However, the cited portion clearly shows that each physical member/device is not instructed to handle messages addressed to a virtual port or act on behalf of the virtual port. In fact, the physical member/device of Terrell receives a frame addressed to the physical member/device. In other words, the physical member/device is merely performing a transaction by handling a frame addressed to it. The frame is not addressed to a virtual port. The mapping to the physical member/device has already been performed via the routing process.

Accordingly, Terrell fails to anticipate claims 19 and 20 for at least those reasons set forth above.

Claim 21, as amended, recites:
In a first network device, a method of implementing storage virtualization in a storage area network, the method comprising:
sending a virtualization message to a port of a second network device within the storage area network, the virtualization message instructing the port to handle messages addressed to a virtual port of a virtual enclosure, the virtual enclosure being a virtual entity having one or more virtual ports and being adapted for representing one or more virtual

storage units, wherein a number of virtual ports to be included in the virtual enclosure is configurable, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network, <u>wherein each of the virtual ports is associated with a port of a network device within the storage area network to create a set of virtual port associations such that the virtual ports of the virtual enclosure are associated with one or more ports of one or more network devices within the storage area network, wherein each of the virtual ports is associated with the same port or a different port from other virtual port associations and wherein each of the virtual ports is associated with the same network device or a different network device from other virtual port associations,</u> wherein the virtualization message indicates that the port is to handle messages addressed to an address or identifier assigned to the virtual port that are received by the port of the second network device subsequent to the virtualization message sent by the first network device such that the first network device instructs the port of the second network device to act on behalf of the virtual port; and

receiving a virtualization response from the port of the second network device in response to the virtualization message.

Terrell fails to anticipate claims 21 and 32-34 for at least those reasons set forth above with respect to claim 19.

Claim 35, as amended, recites:

A method of implementing storage virtualization in a first network device of a storage area network, the method comprising:

receiving a virtualization message at a port of the first network device from a second network device within the storage area network, the virtualization message instructing the port to handle messages addressed to a virtual port of a virtual enclosure that are received by the port of the first network device subsequent to the virtualization message sent by the second network device such that the second network device instructs the port of the first network device to act on behalf of the virtual port, the virtual enclosure being a virtual entity

having one or more virtual ports and being adapted for representing one or more virtual storage units, wherein a number of virtual ports to be included in the virtual enclosure is configurable, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network, <u>wherein each of the virtual ports is associated with a port of a network device within the storage area network to create a set of virtual port associations such that the virtual ports of the virtual enclosure are associated with one or more ports of one or more network devices within the storage area network, wherein each of the virtual ports is associated with the same port or a different port from other virtual port associations and wherein each of the virtual ports is associated with the same network device or a different network device from other virtual port associations,</u> wherein the virtualization message indicates that the port is to handle messages addressed to an address or identifier assigned to the virtual port that are subsequently received by the port; and

sending a virtualization response from the port of the first network device to the second network device in response to the virtualization message.

Terrell fails to anticipate claims 35 and 50-52 for at least those reasons set forth above with respect to claim 19.

<u>REJECTION OF CLAIMS UNDER 35 USC §103</u>

In the Office Action, the Examiner has rejected claims 22-28, 29, 31, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, and 49 as being unpatentable over Terrell in view of Blumenau et al, U.S. Patent No. 6,260,120, ('Blumenau' hereinafter). This rejection is fully traversed below.

Blumenau fails to cure the deficiencies of Terrell as set forth above.

In accordance with the pending claims, since a virtual port may be "implemented" by a port of any network device within the storage area network, a network's virtualization capacity may scale with the number of ports in the network. Moreover, sending a message to

a port of a network device within the storage area network enables virtualization within a storage area network to be dynamically established.

The cited references, separately or in combination, fail to support the implementation of virtualization among any number of network devices within a storage area network, as claimed. Moreover, the cited references, separately or in combination, fail to support the dynamic implementation of virtualization of storage within a storage area network through the use of a virtualization message, as claimed. In fact, as set forth in col. 24, lines 25-33 of Blumenau, the "port adapter providing the physical port is programmed to function as an FL_Port, E_Port or F_Port..." However, the instruction of a physical port to function on behalf of a virtual port as set forth in Blumenau is not dynamic. Rather, the physical port is merely programmed to operate in this manner. There is nothing to indicate that such programming refers to the dynamic sending of messages. As such, Blumenau teaches away from the dynamic implementation of virtualization of storage within a storage area network through the use of a virtualization message. Moreover, the combination of the cited references would fail to operate as claimed, and therefore would fail to achieve the desired result. Accordingly, Applicant respectfully submits that the independent claims are patentable over the cited references.

The dependent claims depend from one of the independent claims and are therefore patentable for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. For example, claim 14 recites "assigning one or more virtual storage units to the virtual enclosure."

The additional limitations recited in the independent claims or the dependent claims are not further discussed, as the above discussed limitations are clearly sufficient to distinguish the claimed invention from the cited reference. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §103.

SUMMARY

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 504480 (Order No. ANDIP007).

Respectfully submitted,
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